

WHEREFORE, WE CLAIM

1. A ball-throwing machine including means to interchangeably deliver pitches of different types to different locations at different speeds with less than ten second intervals between said pitches of different type, location and speed.

2. A ball-throwing machine of the type having a power head including at least two coaxing wheels for propelling a ball toward a batter to simulate a pitch, said machine including:
means for controlling the rotational speed of each wheel;
means for controlling the horizontal position of the power head; and
means for controlling the vertical position of the power head;

said machine being able to interchangeably deliver pitches of different types to different locations at different speeds with less than ten-second intervals between said pitches of different type, location and speed.

1 3. A ball-throwing machine of the type having a power head including three coaxing
2 wheels for propelling a ball toward a batter to simulate a pitch, said machine having:
3 means for causing each of said wheels to rotate at a predetermined speed;
4 means for causing the power head to move to a predetermined horizontal position;
5 means for causing the power head to assume a predetermined vertical position; and
6 means for controlling the rotational speed of each wheel, the horizontal position of the
7 power head and the vertical position of the power head;
8 said machine being able to interchangeably deliver pitches of different types to different locations
9 at different speeds with less than ten second intervals between said pitches.

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11 4. The ball-throwing machine of claim 3, wherein said wheels are positioned on said
12 power head at equal distances relative to the ball being propelled.

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14 5. The ball-throwing machine of claim 3, wherein said means for controlling the rotational
15 speed of each wheel includes a motor and a drive control, wherein said drive control includes
16 means for rapidly changing the speed of each wheel.

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18 6. The ball-throwing machine of claim 5, wherein said means for rapidly decelerating the
19 speed of each wheel comprises dynamic braking means.

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21 7. The ball-throwing machine of claim 5, wherein said motor is an AC motor.

1 8. The ball-throwing machine of claim 3, wherein said power head is pivotably mounted
2 on a base at a center pivot about which the power head may be pivoted in both a horizontal and a
3 vertical direction.

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5 9. The ball-throwing machine of claim 8, wherein said means for causing the power head
6 to move to a predetermined horizontal position comprises at least one horizontal linear actuator
7 adapted to cause said power head to rotate in a horizontal plane about a center pivot and wherein
8 said means for causing the power head to move to a predetermined vertical position comprises at
9 least one vertical linear actuator adapted to cause said power head to rotate in a vertical plane
10 about said center pivot.

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12 10. The ball-throwing machine of claim 3, wherein said means for controlling comprises a
13 programmable controller.

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15 11. The ball-throwing machine of claim 10, wherein said programmable controller
16 includes a programmable microprocessor.

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18 12. The ball-throwing machine of claim 11, wherein said programmable microprocessor
19 includes a data table that includes the speed of each wheel, the horizontal position of the power
20 head and the vertical position of the power head for each pitch type at each speed and each
21 location.

1 13. The ball-throwing machine of claim 11 wherein said programmable microprocessor
2 may be operated in a manual mode in which an individual can manually select for each pitch its
3 type, speed and location or in an automatic mode in which the microprocessor is pre-programmed
4 to deliver different pitches at different speeds to different locations in a pre-programmed
5 sequence.

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7 14. The ball-throwing machine of claim 11, wherein said programmable microprocessor
8 includes a smart card reader adapted to read a pre-programmed smart card in order to re-program
9 said microprocessor.

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11 15. The ball-throwing machine of claim 14, wherein the smart card contains a pre-
12 programmed sequence of pitches.

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14 16. The ball-throwing machine of claim 3, wherein said ball-throwing machine further
15 includes means to visually display an image of a pitcher on a video display and means to
16 synchronize the propelling of said balls from said machine with the image displayed on the video
17 display.

1 17. A ball-throwing machine of the type having a power head including at least two
2 coaxing wheels for propelling a ball toward a batter to simulate a pitch, said machine including:
3 means for causing each of said wheels to rotate at a predetermined speed;
4 means for causing the power head to move to a predetermined horizontal position;
5 means for causing the power head to assume a predetermined vertical position;
6 a programmable controller for individually controlling the rotational speed of each wheel,
7 the horizontal position of the power head and the vertical position of the power head;
8 said machine being able to interchangeably deliver pitches of different types to different locations
9 at different speeds with less than ten second intervals between pitches.

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11 18. The ball-throwing machine of claim 17, wherein said power head has three coaxing
12 wheels.

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14 19. The ball-throwing machine of claim 17 further including means to visually display an
15 image of a pitcher on a video display and means to synchronize the propelling of said balls by said
16 machine with the image displayed on the video display.

1 20. A ball-throwing machine of the type having a power head including at least two
2 coaxing wheels for propelling a ball toward a batter to simulate a pitch, said machine including:
3 means for causing each of said wheels to rotate at a predetermined speed;
4 means for causing the power head to move to a predetermined horizontal position;
5 means for causing the power head to assume a predetermined vertical position;
6 a programmable controller for individually controlling the rotational speed of each
7 individual wheel, the horizontal position of the power head and the vertical position of the power
8 head; and
9 a smart card reader adapted to read a pre-programmed smart card in order to re-program
10 said programmable controller, wherein said smart card contains a pre-programmed sequence of
11 pitches;
12 said machine being able to interchangeably deliver pitches of different types to different locations
13 at different speeds with less than ten second intervals between pitches.

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15 21. The ball-throwing machine of claim 20, wherein said power head has three coaxing
16 wheels.

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18 22. The ball-throwing machine of claim 20 further including means to visually display an
19 image of a pitcher on a video display and means to synchronize the propelling of said balls by said
20 machine with the image displayed on the video display.

1 23. A ball-throwing machine of the type having a power head including at least two
2 coacting wheels for propelling a ball toward a batter to simulate a pitch, said machine including:
3 means for causing each of said wheels to rotate at a predetermined speed;
4 means for causing the power head to move to a predetermined horizontal position;
5 means for causing the power head to assume a predetermined vertical position;
6 a programmable controller for individually controlling the rotational speed of each
7 individual wheel, the horizontal position of the power head and the vertical position of the power
8 head;
9 a smart card-reader adapted to read a pre-programmed smart card in order to re-program
10 said microprocessor, wherein said smart card contains a pre-programmed sequence of pitches; and
11 means for visually displaying an image of a pitcher on a video display and means to
12 synchronize the propelling of said balls with the image displayed on the video display,
13 said machine being able to interchangeably deliver pitches of different types to different locations
14 at different speeds with less than ten second intervals between pitches.

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16 24. The ball-throwing machine of claim 23, wherein said power head has three coacting
17 wheels.
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1 25. A sports training device, said device including:
2 means for displaying the image on a surface of a sports figure in motion; and
3 means for interchangeably propelling balls of different types through said surface in
4 synchronization with said image to different locations at different speeds and different rotational
5 velocities with less than ten-second intervals between successive balls being propelled.

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7 26. The sports training device of claim 25, wherein said device is a batting cage.

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9 27. The sports training device of claim 26, wherein said sports figure is a pitcher winding
10 up and throwing a baseball.

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12 28. The sports training device of claim 25, wherein said means for propelling comprising
13 a ball-throwing machine of the type having a power head including at least two coacting wheels
14 for propelling a ball, said machine including:

15 means for controlling the rotational speed of each wheel;

16 means for controlling the horizontal position of the power head; and

17 means for controlling the vertical position of the power head.

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19 29. The sports training device of claim 28, wherein said means for propelling further
20 includes means for programming said ball-throwing machine to deliver a predetermined sequence
21 of pitches of a predetermined profile.

add a^2 \rightarrow

Add B^2